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ARIZONA STATE UNIVERSITY ■ COLLEGE OF BUSINESS
CENTER FOR BUSINESS RESEARCH

Metro Phoenix Home Appreciation

Rates Slow Significantly; Townhouses Depreciate

Single-family homes in the Phoenix metropolitan area continued to appreciate during 1988, though not as much as in 1987. More townhouses depreciated during the year than gained value.

The median rate of appreciation for single-family homes declined to approximately 1.8 percent in 1988, down from 2.4 percent in 1987, and was lower than in any year since the appreciation rate study began in 1981. Most townhouses and condominiums (hereafter referred to as townhouses or townhomes) did not appreciate; the median townhouse sold during 1988 depreciated 0.8 percent. Appreciation rates of both single-family homes and townhomes were significantly lower than the 1988 Metropolitan Phoenix inflation rate of 4.1 percent.

The decline in the appreciation rate has further extended the length of time the typical seller utilizing the services of a realtor must own their home in order to break even. During 1988, the annual rate of 1.8 percent means that homeowners selling through a realtor, as a majority of all sellers do, had to hold their home at least 3-1/2 years to break even. Realtors' fees, although often necessary to sell the home at all, simply compounded the depreciation of townhouses.

Of all homes sold more than once between 1981 and 1988, 38,257 constitute the single-family data base after removing sales that did not meet the selection criteria. Another 3,369 homes make up the townhouse data base. Throughout this article, less detail is provided on townhomes because of their relatively small number.

HOUSING APPRECIATION, 1981-88

The single-family home appreciation rate has slowed gradually since 1981, but the decline during 1988 was significantly greater than during any prior year (see Figure I, page 2). Even though some townhouses posted positive appreciation rates, the median townhouse sold in 1988 brought less than its original purchase price. The townhouse rate has decelerated more sharply than the single-family rate since the townhome portion of the study began in 1984; the rate in 1988 was

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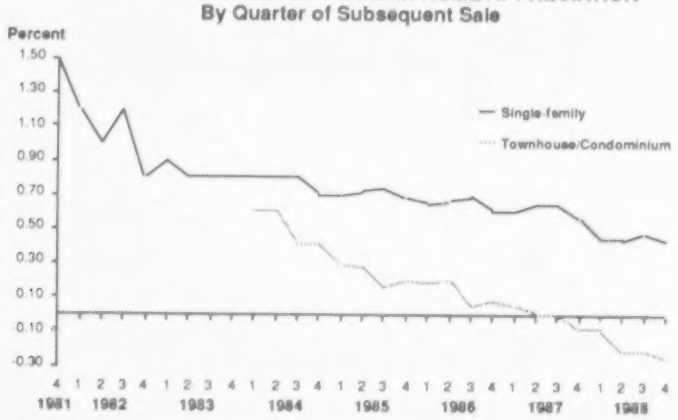
–0.8 percent, down from 0.0 during 1987.

Home appreciation has not kept up with inflation in consumer prices since 1984 (see Table 1). Between 1983 and 1988, the metro Phoenix consumer price index rose 23.8 percent while the national price index rose 22.6 percent. Phoenix area homes appreciated only 18.2 percent (compounded quarterly) during the same time.

The median sales price for both single-family homes and townhomes increased more than either the appreciation or inflation rates. However, the higher rates are due to increases in the size of the typical home; the median sales price per square foot increased less than the inflation rates, but still more than the appreciation rates.

FIGURE I
MEDIAN RATE OF METRO PHOENIX HOME APPRECIATION
By Quarter of Subsequent Sale



Note: Quarterly data for townhouses/condominiums are not available prior to 1984 due to an insufficient number of sales.

Source: Arizona Real Estate Center, College of Business, Arizona State University.

By Price

The price of the home exerts the strongest influence on the rate of appreciation. Single-family homes that sold for more than $100,000 appreciated about three times as fast as those that sold for less than $60,000. The overall median rate of appreciation for both new and resale homes is inhibited by the abundance of lower-priced homes. All price ranges of both new and resale homes greater than $100,000 appreciated more than 3 percent per year.

This relationship between price and appreciation also holds after adjusting the sales price for the size of the home. Homes that sold between 1981 and 1988 for a price in

TABLE 1
INFLATION MEASURES

	Percent Change*						
	1983	*1984*	*1985*	*1986*	*1987*	*1988*	*1983-88 Total*
Metropolitan Phoenix Consumer Price Index	1.6	5.8	5.0	1.3	4.1	4.1	23.8
U.S. Consumer Price Index	3.2	4.3	3.6	1.9	3.7	4.1	22.6
Phoenix Area							
All single-family homes:							
Appreciation rate	3.6	3.2	2.9	2.8	2.5	2.0	18.2
Median sales price	4.8	6.3	4.0	6.5	5.0	0.1	29.7
New single-family homes:							
Appreciation rate	5.7	4.7	4.8	4.2	3.7	3.0	29.1
Median sales rice	6.0	9.9	8.1	11.3	7.6	4.3	57.3
Existing single-family homes:							
Appreciation rate	2.9	2.7	2.6	2.4	2.1	1.7	15.3
Median sales price	4.6	4.8	3.2	2.0	3.5	0.5	20.0
Median sales price per-square-foot	2.9	3.0	2.2	3.1	2.2	–0.3	13.8
All townhouses and condominiums:							
Appreciation rate	NA	NA	1.3	0.7	0.1	–0.5	NA
Median sales price	1.8	8.8	1.0	6.8	–2.9	–1.5	14.3
Existing townhouses and condominiums:							
Appreciation rate	NA	NA	1.5	1.1	0.2	–0.5	NA
Median sales price	2.9	3.3	–1.6	2.6	–2.9	–0.8	3.4
Median sales price per-square-foot	3.3	2.5	–1.4	3.6	–0.7	–1.2	6.1

*Calculated at a quarterly compound rate. Appreciation rates in this table may differ slightly from those in the rest of the report due to the different method of compounding.

NA: Not available due to insufficient number of sales.

Source: Arizona Real Estate Center, College of Business, Arizona State University. U.S. Consumer Price Index is from the U.S. Department of Labor, Bureau of Labor Statistics. Metropolitan Phoenix Price Index is from the Center for Business Research, College of Business, Arizona State University.

excess of the median $55 per square foot appreciated 3.9 percent per year, compared to a rate of 2.1 percent per year for less expensive homes. This relationship is the same as last year, when a median per-square-foot amount of $54 was used.

New single-family homes that sold for more than $200,000 had the highest rate of appreciation between 1981 and 1988—about 6.6 percent annually (see Table 2). All categories of new single-family homes selling for $90,000 or more had rates in excess of the 3.7 percent rate for all new homes, while all categories under $90,000 had rates below to the overall median.

For resale single-family homes, the highest rate of appreciation (4.6 percent) occurred for homes selling for $200,000-299,000, followed by homes selling for $300,000 or more. The difference between rates for new and resale homes increased as

TABLE 2
MEDIAN RATE OF METRO PHOENIX HOME APPRECIATION
By Price Range
Percent Change Per Year, 1981–88

	Single-Family			Townhouse/
	Total	*New*	*Resale*	Condo
Less than $40,000	–0.8	*	–0.6	–4.0
40,000–49,999	0.6	0.4	0.6	–0.8
50,000–59,999	1.7	1.4	1.8	0.0
60,000–69,999	2.0	2.0	2.0	0.9
70,000–79,999	2.4	2.8	2.3	1.8
80,000–89,999	2.6	3.5	2.4	1.2
90,000–99,999	2.8	3.8	2.6	1.5
100,000–109,999	3.7	4.9	3.2	0.8
110,000–119,999	3.8	5.3	3.2	1.2
120,000–129,999	3.3	3.8	3.2	1.0
130,000–139,999	3.6	4.6	3.2	*
140,000–149,999	3.6	4.7	3.2	*
150,000–174,999	3.1	5.1	3.0	1.2
175,000–199,999	3.9	6.2	3.6	*
200,000–299,999	4.8	6.6	4.6	*
300,000+	4.0	*	3.8	*
TOTAL	2.4	3.7	2.0	0.3

*Insufficient number of sales

Source: Arizona Real Estate Center, College of Business, Arizona State University.

TABLE 3
MEDIAN RATE OF METRO PHOENIX HOME APPRECIATION
By Geographic District
Percent Change Per Year, Single-family Only

*District**		*1981-83***	*1984*	*1985*	*1986*	*1987*	*1988*	*1981-88***
1N	North Scottsdale	3.4	3.5	4.6	3.4	3.7	3.1	3.5
1S	South Scottsdale	2.6	2.8	2.5	2.4	2.3	1.8	2.4
2	Paradise Valley	5.3	4.2	3.5	2.9	3.2	2.8	3.1
3	North Sunnyslope/Moon Valley	2.9	2.6	2.5	2.5	2.1	1.5	2.1
4N	Northwest Phoenix	3.6	3.0	2.2	2.4	2.0	1.2	2.1
4S	Metrocenter	1.7	2.3	2.3	1.8	1.8	1.1	1.7
5	Sun City/Youngtown/Peoria	4.9	5.0	3.6	3.6	2.7	1.5	2.8
6	Glendale	3.4	2.6	2.4	2.0	2.0	1.4	2.0
7	Christown	1.9	2.1	2.0	1.9	1.5	1.2	1.7
8	North Central Phoenix	2.5	3.8	4.4	3.0	2.	1.8	2.8
9	East Camelback	2.6	3.9	3.5	2.6	2.8	2.2	2.7
10	East Central Phoenix	2.2	4.5	2.1	3.4	1.7	2.4	2.6
11	Mid-town Phoenix	1.9	3.0	4.3	3.0	3.9	2.2	3.0
12	West Central Phoenix	2.7	2.6	2.7	2.4	2.6	1.4	2.4
13	Maryvale	2.0	2.0	1.8	1.6	1.3	0.3	1.3
14	Downtown/South Central Phoenix	0.0	3.9	0.7	2.7	3.1	3.9	2.8
15	South Phoenix/Ahwatukee	3.3	4.3	2.9	3.6	2.9	2.4	3.0
16N	North Tempe	3.0	0.9	3.0	3.2	2.1	2.0	2.5
16S	South Tempe	3.0	2.2	2.7	2.5	2.1	2.0	2.2
17N	North Mesa	3.8	2.0	2.5	3.2	2.8	1.8	2.4
17S	South Mesa	3.6	3.9	3.6	2.6	2.6	1.9	2.7
18	East Mesa	4.7	3.4	3.7	3.4	3.7	2.4	3.4
19	Chandler/Gilbert	3.4	3.6	4.5	3.6	3.6	2.6	3.4
20	Western Suburbs	4.6	2.2	3.9	2.5	1.5	0.7	1.6
21	Deer Valley	4.0	2.8	2.3	2.3	1.9	1.4	2.0
22W	Sun City West/Rural Maricopa County	6.3	8.6	9.8	7.0	7.8	6.8	7.8
TOTAL, METROPOLITAN PHOENIX		3.4	3.1	2.9	2.6	2.4	1.8	2.4

*District numbers correspond to the districts in Figure II on page 4.

**Median percent change for each year within range.

Source: Arizona Real Estate Center, College of Business, Arizona State University. District designations are copyrighted by the Phoenix Metropolitan Housing Study Committee.

the price increased. Resale homes appreciated at rates equal to or slightly above new homes at prices below $70,000, but the spread between new and resale homes increased to 1.5 percent or more when sales prices were $100,000 or more.

Townhouses showed less upward trending as the price increased, but the lowest priced units did exceptionally poorly. Units selling for less than $40,000 depreciated 4.0 percent, and positive rates were not reached until the price was $60,000 or higher.

New vs. Resale Homes

While a "new" single-family home (defined as one originally constructed between 1981 and 1988, and sold at least twice during that period) appreciated faster than an existing home in all price ranges greater than $70,000, the difference is largely illusory. The more rapid 3.7 percent appreciation rate of new homes—nearly double the 2.0 percent rate of existing homes—lasted only until the first resale of the home.

At least a portion of the gain reflects additional expenses that most buyers of new homes incur in making improvements, such as landscaping, which add to the value of the property. Further, new homes generally are more expensive than resale homes, even on a price-per-square-foot basis. Thus, new homes appreciate faster mainly because of improvements and higher prices.

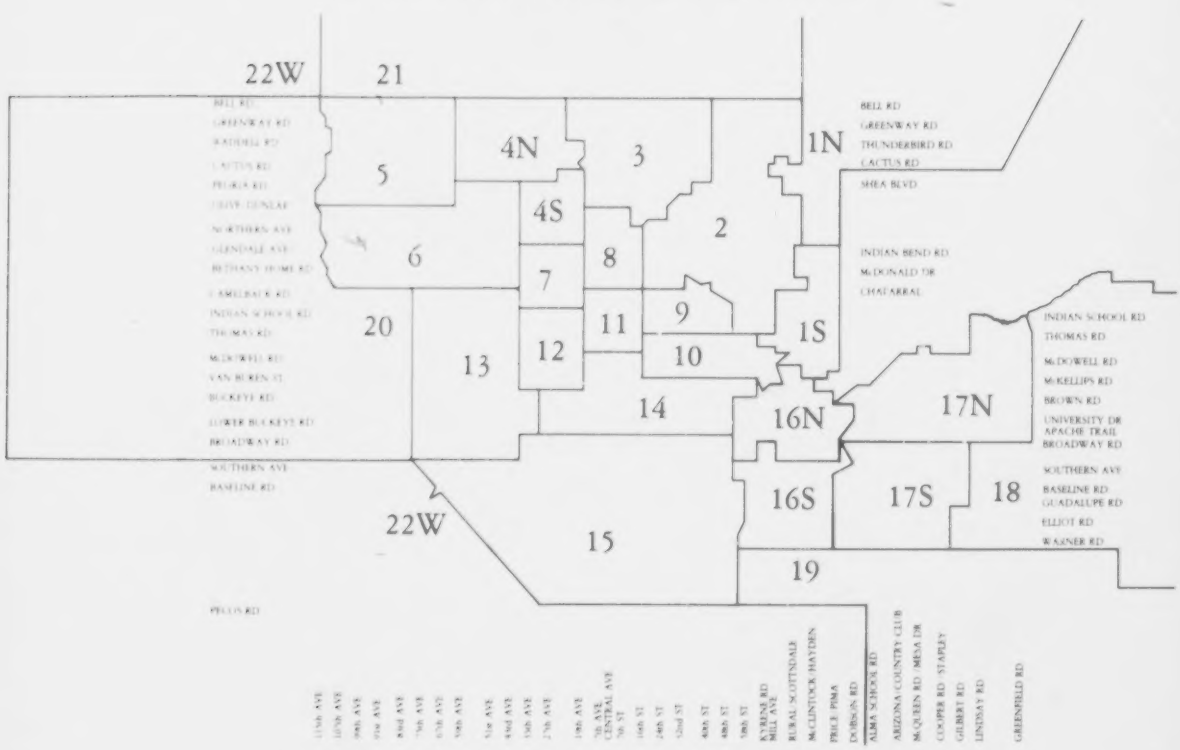
In contrast to single-family homes, new townhomes appreciated no faster than resale units from 1981 to 1988. One cause for the lower townhouse appreciation rate is the smaller price difference between new and existing townhomes. Other factors, however, such as relatively low demand for townhomes, probably better explain the difference.

By Geographic Area

Housing appreciation rates vary throughout the Valley (see Table 3, page 3), but most of the deviation can be explained by variations in price and the proportion of new homes. Rates in 1988 ranged from 1.1 percent to 3.9 percent in all areas except Maryvale and the Western Suburbs, which were slightly lower, and Sun City West, which was higher.

While the 1981-88 appreciation rate in a number of districts (illustrated in Figure II) was significantly different from the metro total in a statistical sense, the difference usually was slight in a practical sense. The

FIGURE II
PHOENIX METROPOLITAN AREA STATISTICAL DISTRICTS



Note: Districts 1N, 18, 19, 21, 22E and 22W extend to the Maricopa County boundaries. See Table 2 for single-family home appreciation data for all districts outlined above.

Source: Phoenix Metropolitan Housing Study Committee.

annualized rate ranged from 2.0–3.5 percent in all districts except Christown, Maryvale, Metrocenter and the Western Suburbs (which were slightly lower) and Sun City West (which was considerably higher).

The highest appreciation rates occurred in the newer and/or more expensive districts of North Scottsdale and Chandler/Gilbert and in the retirement areas of Sun City West and East Mesa. The lowest appreciation rates were measured in the older and/or less expensive areas of Phoenix, including Maryvale, Christown and Metrocenter.

Between 1981 and 1988, the appreciation rate in most districts declined modestly, similar to the slight deceleration measured Valleywide. In several districts, the rate was erratic from year to year, largely the result of few homes reselling.

The most significant downward trends occurred in Northwest Phoenix, Sun City, Deer Valley and the Western Suburbs. All four areas appreciated faster than the median metro rate of 3.4 percent during 1981-83, but fell below the median rate of 1.8 percent in 1988. Only in Sun City West, North Scottsdale, East Mesa and Chandler/Gilbert did home values consistently appreciate faster than the metro median.

In Sun City West, home appreciation kept up with the Valley's 4.1 percent rate of inflation in 1988—all other areas recorded slower appreciation. During the period from 1981-88, only North Scottsdale, Paradise Valley and Sun City West have kept pace with the Phoenix rate of inflation, although Sun City, East Mesa and Chandler/Gilbert came very close.

The small number of townhouses that sold more than once prevented using a geographic division with the same amount of detail as that for single-family homes. Except in the West Valley, where townhouse sales occurred primarily in Sun City West, the appreciation rate of townhomes was less than that of single-family homes (see Table 4). Townhomes appreciated at rates greater than one percent per year only in Sun City West and the Southeast Valley. In most districts, townhouse rates were two to three percent below single-family rates. The geographic pattern was similar for both townhouses and single-family homes.

OUTLOOK

Little change in the rate of appreciation for either single-family homes or townhouses is likely in 1989, although a further overall decline for 1981–89 is likely as additional low rates are added in 1989. Metro Phoenix's real estate market will likely remain slow during 1989, resulting in continued low rates of appreciation. When the market does rebound (probably in late 1990 or 1991, depending partially on the national economy), appreciation rates should improve as well. However, homes in the Phoenix area should not be expected to appreciate more than the inflation rate even when the market recovers. After the aberrations of the 1970s, the residential housing market has returned to the stable conditions of preceding decades. The general inflation rate, housing affordability and supply–demand relationships remain relatively steady. The possible exceptions might be a continuation of the falling demand for townhouses, particularly resale units, which could lower their rate of appreciation slightly, and an increased rate for selected properties which are being purchased at bargain rates due to defaults and foreclosures. The higher-than-average rates for these homes when they are resold should counter the depreciation the original owner may encounter when selling under distressed circumstances.

The current trend to purchase larger, more expensive homes should continue to widen the spread between appreciation rates on higher-priced and lower-priced homes. However, the new extremes should offset each other except in those areas which are dominated by homes at either end of the price scale. Overall appreciation rates in 1989 can be expected to approximate or be slightly lower than the current levels.

– **Sharla Kivett,** *Research Analyst*
Arizona Real Estate Center

TABLE 4
COMPARISON OF SINGLE-FAMILY HOME TO TOWNHOUSE/CONDOMINIUM APPRECIATION
By Combined Geographic District
Median Percent Change Per Year, 1981-88

District		Single-family	Townhouse/ Condominium
1N, 2	North Scottsdale/Paradise Valley	3.2	0.6
1S	South Scottsdale	2.4	0.6
3, 8	North Central Phoenix	2.2	–0.7
4N, 4S	Northwest Phoenix	2.0	–0.7
5	Sun City/Youngown/Peoria	2.8	0.9
6	Glendale	2.0	–0.2
7, 12, 13	West Phoenix	1.5	–1.0
9, 10, 11, 14, 15	East Central and South Phoenix	2.8	0.1
16N, 16S	Tempe	2.3	0.0
17N, 17S, 18, 19	Southeast Valley	3.0	1.3
20, 22W	West Valley	4.0	4.6
21	North Valley	2.0	0.3
TOTAL, METROPOLITAN PHOENIX		2.4	0.3

Source: Arizona Real Estate Center, College of Business, Arizona State University. District designations are copyrighted by the Maricopa County Housing Study Committee.

Complete Report Available

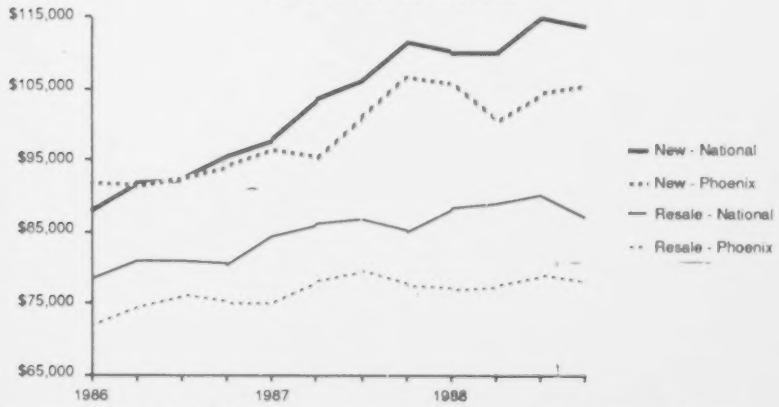
This article summarizes a more detailed report on the appreciation of homes in the Phoenix area during the 1980s. Copies of the complete report, *Focus on Appreciation,* which includes a number of tables with textual interpretation, as well as analysis by district, city, price ranges, and new resale may be obtained for $5.00 by calling or writing the Arizona Real Estate Center, College of Business, Arizona State University, Tempe, AZ 85287; (602) 965-5440.

'88 Valley Home Sales Lowest Since 1982

Fewer homes were sold in 1988 than in any year since the 1982 recession, and price increases were smaller than in any year since 1982. These conditions created a good market for homebuyers, but a potentially difficult market for sellers, resulting in low appreciation rates and a longer-than-average time required to sell the typical home.

Many factors contributed to the weak local real estate market, including prior overbuilding, high vacancy rates, low job growth and low net in-migration. These factors seem to have bottomed out, but the real estate market will continue to feel their impact for some time.

FIGURE I
MEDIAN SALES PRICE OF SINGLE-FAMILY HOMES
National vs. Phoenix Area



Source: Arizona Real Estate Center, College of Business, Arizona State University.

Home sales in 1988 totalled only 49,770, down 13 percent from 1987. New homes, especially townhouses, were hit harder than resale homes; new single-family home sales fell 16 percent, while new townhouse sales fell 48 percent from the prior year. Resale single-family home sales fell 11 percent, but resale townhouse sales were relatively strong. However, resale townhomes were the only housing type in which the median price fell from the prior year, indicating that buyers are taking advantage of low-priced "deals" in this sector. (See Table 1).

The median price of all homes sold in the Phoenix metropolitan area during 1988 was $81,500, an increase of only 0.6 percent from 1987, down from 1987's increase of 3.2 percent over 1986. This advance was only slightly larger than during the 1982 recession, when prices fell 0.1 percent.

New homes accounted for almost all of the price gain; new single-family home prices increased 4.3 percent from 1987 (to $103,950) and new townhouse prices accelerated 8.1 percent (to $83,020). However,

TABLE 1
METROPOLITAN PHOENIX HOME SALES

	Single-Family			Townhouse/Condominium			
Median Sales Price	*Resale*	*New*	*Total*	*Resale*	*New*	*Total*	*Grand Total*
1981	$65,000	$74,800	$65,900	$60,000	$64,400	$60,500	$65,000
1982	65,000	66,100	65,500	59,725	47,025	57,000	64,325
1983	68,000	70,050	68,650	61,450	51,650	58,000	67,000
1984	71,250	76,950	73,000	63,500	62,600	63,100	71,025
1985	73,500	83,200	75,925	62,475	65,050	63,700	74,000
1986	75,000	92,640	80,850	64,110	74,510	68,000	78,500
1987	77,650	99,650	84,900	62,230	76,790	66,000	81,010
1988	78,000	103,950	85,000	61,750	83,020	65,000	81,500
Number of Sales							
1981	35,000	2,410	37,410	5,260	610	5,870	43,280
1982	23,880	3,960	27,840	4,050	1,390	5,440	33,280
1983	33,640	9,560	43,200	5,060	2,540	7,600	50,800
1984	37,180	10,040	47,220	5,170	3,270	8,440	55,660
1985	38,610	10,170	48,780	4,860	2,740	7,600	56,380
1986	35,600	12,680	48,280	7,230	3,910	11,130	59,420
1987	33,230	12,810	46,040	7,530	3,560	11,090	57,130
1988	29,680	10,780	40,450	7,440	1,870	9,310	49,770

Source: Arizona Real Estate Center, College of Business, Arizona State University; from data supplied by Marketron Services, Inc., Phoenix (1981-85) and Real Estate Evaluation Group (1986-88).

Note: Numbers derived from the two data sources above are not consistent in the breakdown between new and resale homes. Sales and prices for 1986-88 are more accurate in the new/resale breakdown; the number of new sales is underestimated for 1981-85 and the number of resales is overestimated by the same amount. All years are reliable for the total number of sales. Data consistent with the 1981-85 series has been presented monthly in the back page table in *Arizona Business* or can be obtained by writing or calling Arizona Real Estate Center, College of Business, Arizona State University, Tempe, AZ 85287, (602) 965-5440.

the median price-per-square-foot did not increase for any home type, meaning that homebuyers are purchasing larger, more expensive homes rather than paying more for an equivalent home. The new townhouse price increase also indicates that a high proportion of townhouse sales occurred in the higher price ranges.

NATIONAL SALES AND PRICES

The number of resale single-family homes sold nationally increased 3 percent, considerably stronger than the 11 percent decline locally. The median national resale home price increased 4 percent to $89,100, while the local median remained flat at $78,000, reducing national affordability. New single-family home prices were also higher nationally—$112,500 compared to the local median of $103,950. The differential between local new home prices and national prices has been growing throughout the 1980s. (See Figure I, page 6).

OUTLOOK

The Valley's current weak real estate market will continue at least through 1989, possibly worsening slightly during the year. Conditions should improve as effects of local overbuilding are reduced. However, the local economy will need to show improvement in job growth, net in-migration and vacancy rates before recovery will be complete. The combination of all necessary factors for significant improvement should not be expected until late 1990 or 1991, possibly later if the national economy has a negative impact on the local economy.

Home sales during 1989 will probably approximate 1988 levels; the Arizona Real Estate Center expects about 13,000 single-family permits to be issued during 1989, compared to 1988's 13,800 new permits.

– **Sharla Kivett,** *Research Analyst*
Arizona Real Estate Center

1988 Valley Home Affordability Stable

At least one bright spot exists in the Phoenix area real estate market—home affordability. Valley homes were more affordable during 1988 than at any time since the indexes began in 1981.

Mortgage rates have been stable and relatively low during 1988 (though slightly higher than in 1987), while household incomes have been rising. Mortgage rates averaged 10.8 percent in 1988 and 10.6 percent in 1987. (See Table 1).

Prices of new single-family homes have been relatively flat since fourth quarter 1987, resulting in a new home affordability index of 91 during 1988, equal to 1987's index. Resale home prices have experienced little fluctuation since second quarter 1987. Higher household incomes and the slightly higher 1988 mortgage rates combined to result in an affordability index of 121, above 1987's level of 117 and considerably above the new home index level. (Definitions of terms used in this article are available upon request).

The greater improvement in resale affordability compared to new home affordability once again widened the spread between the two indexes to the largest difference ever—30 points, up from last year's record difference of 26 points.

An index of 100 or more indicates that a median-income household is able to qualify for a median-priced home, assuming a 15 percent downpayment on a fixed-rate, conventional, 30-year mortgage and an income qualification factor of 28 percent. During 1988, a median-income household could afford a $96,350 home, more than the median-priced resale home of $78,000, but less than the median-priced new home of $103,950. *(continued)*

TABLE 1
HOUSING AFFORDABILITY INDEXES
Metropolitan Phoenix; Single-family Only

			Resale Homes			New Homes		
Year	*Median Gross Monthly Income*	*Effective Interest Rate*	*Median Sales Price*	*Monthly Housing Payment*	*Affordability Index*	*Median Sales Price*	*Monthly Housing Payment*	*Affordability Index*
1981	$1,990	16.7%	$65,000	$910	61	$74,800	$1,050	53
1982	2,160	16.7	65,000	910	67	68,100	920	66
1983	2,270	13.7	68,000	790	80	70,050	820	78
1984	2,470	14.2	71,250	860	81	76,950	920	75
1985	2,640	12.9	73,500	810	92	83,200	910	81
1986	2,800	10.6	75,000	690	113	92,650	850	92
1987	2,990	10.6	77,650	710	117	99,650	920	91
1988	3,160	10.8	78,000	730	121	103,950	970	91
Quarter								
1st 1988	$3,100	10.7%	$77,000	$720	121	$105,560	$980	88
2nd 1988	3,140	10.8	77,600	730	120	100,540	940	93
3rd 1988	3,170	10.9	79,000	740	119	104,400	980	90
4th 1988	3,210	10.8	78,000	730	123	105,550	990	91

Source: Arizona Real Estate Center, College of Business, Arizona State University. Interest rates are from the Federal Home Loan Bank Board *News;* income is from *Sales and Marketing Management;* national new home prices are from U.S. Bureau of the Census; national resale prices are from National Association of Realtors.

CHANGES IN 1988 AFFORDABILITY

Mortgage interest rates had a very small range during the year, varying from 10.7 percent to 10.9 percent. Interest rates were only slightly higher than in 1986 and 1987, and considerably lower than in any other year of the 1980's.

The price of the median new single-family home increased 4.3 percent, less than the estimated income gain of 5.7 percent. The slight increases in the median price and the mortgage rate resulted in a median monthly housing payment of $970, up 5.4 percent from 1987. The increase in the monthly payment was offset by the increase in monthly incomes, resulting in a year end index of 91, equal to the annual index.

Resale home prices increased negligibly (0.5 percent); when combined with the rise in household incomes, the positive factors outweighed the increase in interest rates, resulting in an increase in the resale index to 123 by year-end, slightly higher than the annual index of 121.

Interest rates have been the strongest determinant of affordability during the 1980s, though the impact has been reduced during the past year due to the lower level of volatility. Even though prices rose 39 percent for new homes and 20 percent for resale homes between 1981 and 1987, monthly housing payments fell 8 percent for new homes and 20 percent for resale homes. This decline in housing payments was due to the six percentage point decline in annualized mortgage rates.

AFFORDABILITY BY INCOME LEVEL

The affordability levels so far have assumed that a household earns the median income. Of course, most people do not earn this amount—half earn more and half earn less. A better idea of affordability for a specific household can be obtained by varying the income, while holding all other factors constant (see Table 2).

For example, a household earning $25,000 annually could still afford a home, but the price would be closer to $62,250—lower than the median-priced resale home. In contrast, a household earning $45,000 could afford a home costing $112,025, higher than the median-priced new home.

NATIONAL AFFORDABILITY

Homes were more affordable locally than nationally; local incomes were higher and prices were lower, although the local mortgage rate was also slightly higher. The spread between local and national affordability levels increased once again over the prior year. The national index value for new single-family homes (82) was nine index points lower than the local level. The resale value of 104 was 17 points lower than the local value.

New home prices nationally have risen 63 percent since 1981, while Phoenix prices rose only 39 percent. Resale home prices increased 35 percent, compared to the local increase of only 20 percent. The median household income rose by a smaller amount between 1981 and 1988 nationally than locally (51 percent vs. 59 percent), and mortgage rates fell by 0.2 percent on both levels.

AFFORDABILITY UNDER DIFFERENT ASSUMPTIONS

The affordability index can change substantially if the assumptions underlying its calculation are varied, as income was varied in Table 2. For example, reducing the amount of the down payment from 15 percent to 10 percent of the purchase price would lower resale home affordability approximately seven index points. If prices had remained constant at 1986 levels, new home affordability would have risen by about four points, but resale levels would have been unaffected.

Shortening the term of the loan would reduce affordability, but not by an appreciable amount until the length drops to approximately 20 years. Lengthening the term past 30 years would have almost no impact.

For the median-income household to afford the median-priced new home, mortgage rates would have had to fall to approximately 9.6 percent, a little over one percent below 1988's level.

Changing the income qualification factor from 28 percent, the upper end of the range set by FNMA, to 25 percent, the lower end of the range, would reduce 1988 affordability by 10-13 index points.

OUTLOOK

Mortgage rates are still the key to home affordability. If mortgage rates rise even slightly during 1989, which is likely, affordability will worsen.

Home prices will continue to be soft during 1989 due to the weak real estate market, benefiting homebuyers in terms of affordability. Once the market recovers, prices can be expected to rise, both as a result of the recovery and due to the trend toward purchasing larger homes with more amenities.

The median household income should continue to advance, although a national economic slowdown would slow local income growth as well. Affordability during 1989 may worsen from 1988's record level, though not significantly, and the spread between the new and resale indexes may continue to widen.

– **Sharla Kivett,** *Research Analyst*
Arizona Real Estate Center

TABLE 2
AFFORDABLE HOME PRICE AND MONTHLY PAYMENT
By Level of Income
(Metropolitan Phoenix; Effective Interest Rate of 10.8 Percent)

Gross Monthly/Annual Income	Sales Price	Monthly Housing Payment	Affordability Index
$1,675/$20,000	$50,050	$470	100
$2,075/$25,000	62,250	580	100
$2,500/$30,000	74,675	700	100
$2,925/$35,000	87,125	820	100
$3,325/$40,000	99,575	930	100
$3,750/$45,000	112,025	1,050	100
$4,175/$50,000	124,475	1,170	100
$6,250/$75,000	186,725	1,750	100
$8,325/$100,000	248,950	2,325	100

Source: Arizona Real Estate Center, College of Business, Arizona State University.

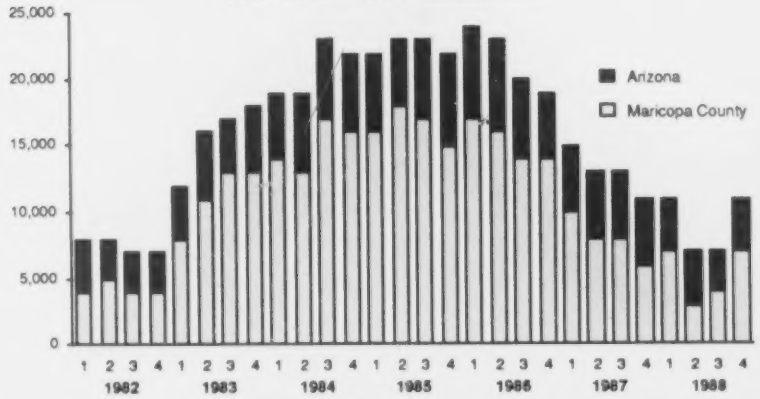
Net Migration a Little Higher in Fourth Quarter

Net in-migration to the Phoenix area totaled 7,000 persons during fourth quarter 1988, returning to the 6,000 to 8,000 range experienced between second quarter 1987 and first quarter 1988 (see Figure I). Inflows during the second and third quarters of 1988 matched the weakest since the late 1960s. The fourth quarter's inflow remained well below the 11,000 average of the 1970s and 1980s.

Net in-migration totaled 21,000 during 1988. Since the late 1960s, a smaller number occurred only in the recession years of 1975 and 1982. Total population change (net natural increase plus net in-migration) was 43,000, putting Maricopa County's population at 2,037,000 at the end of the year.

Statewide, the population was estimated to be 3,534,000 at year-end, up 73,000 during 1988. Net in-migration accounted for approximately one-half of the total change.

FIGURE I
QUARTERLY NET IN-MIGRATION



Source: Center for Business Research, College of Business, Arizona State University

OUTLOOK

The improvement in net migration in the fourth quarter was somewhat larger than anticipated, but further improvement is unlikely in the near-term. Quarterly migration flows generally can be predicted within 2,000 to 3,000 persons from changes in employment that already have occurred (see the February issue for more detail).

Table 1 shows migration flows predicted from employment changes for 1987 into 1989. The prediction made three quarters ahead is based on construction employment and is not as accurate as that made one quarter ahead, which utilizes FIRE (finance, insurance, and real estate) employment as well. Declining employment in these sectors in 1988 made it unlikely that migration flows in the first half of 1989 will be different from those in 1988. The very low flows in mid-1988, however, probably will not be repeated. They resulted from a temporary increase in out-migration resulting from the large number of layoffs experienced in spring 1988. Stabilization of construction employment late in 1988 raises some hope that migration flows will improve later in 1989.

TABLE 1
NET MIGRATION TO MARICOPA COUNTY

Quarter	Predicted Migration: *Three Qtrs. Ahead*	Predicted Migration: *One Qtr. Ahead*	Estimated Migration	Difference: *Three Qtrs. Ahead*	Difference: *One Qtr. Ahead*
First 1987	11	13	10	1	3
Second 1987	8	8	8	0	0
Third 1987	7	9	8	–1	1
Fourth 1987	6	7	6	0	1
First 1988	6	7	7	–1	0
Second 1988	7	6	3	4	3
Third 1988	8	6	4	4	2
Fourth 1988	8	6	7	1	–1
First 1989	7	7	—	—	—
Second 1989	8	—	—	—	—
Third 1989	10	—	—	—	—

Source: Center for Business Research, College of Business, Arizona State University.

– **Tom R. Rex**
Research Manager

Average Wage in 1987 Rose Modestly

The average wage in rural Arizona fell further behind that in the state's urban areas in 1987. The percent change over the 1986 figure was only 2.9 percent in non-urban Arizona—considerably less than the 4.0 percent increase in Pima County and the 4.5 percent gain in Maricopa County. Arizona's increase of 4.2 percent was near the national average of 4.5 percent. An inflation rate of roughly 4 percent indicates that real gains in the average wage were minimal or negative.

The percent change in the average wage varied widely by rural county. Increases in La Paz, Santa Cruz, Cochise and Graham counties exceeded the Phoenix area figure. In contrast, counties with a large mining industry—Gila, Greenlee, Pinal—experienced minimal gains in their average wage.

Greenlee County's 1987 average wage of $24,205 easily was the highest in the state. Most jobs in the county are in the high-paying mining industry. Maricopa was the only other county to exceed the state's average wage of $19,326. Its figure of $20,320 was comparable to the national average.

– **Tom R. Rex**
Research Manager

Annual Average Inflation Rate for '88 Equals That of '87

The 1988 annual average increase in the Metropolitan Phoenix Consumer Price Index, 4.1 percent, was equivalent to the area's rate for 1987 and to the 1988 national average increase. For the past three years, Phoenix area inflation has tracked that of the nation. Inflation rates have remained below those of 1984-85, when the local economy was booming.

Several methods can be used to calculate the inflation rate from the CPI. In this article, the annual average percent change is used: the average of the four quarterly index values for a year, compared to the average of the previous year. The other widely used method is employed in the quarterly CPI reports (see *Arizona Business*, February 1989). It compares the index value at the end of the year to the value at the end of the previous year. Because the inflation rate accelerated during 1988, the annual average increase was less than the year-end inflation rate (5.0 percent).

CONSUMER PRICES IN 1988

Of the seven major categories of the CPI, three—food and beverages, housing, and medical care—experienced inflation rates comparable to that of the all-items average (see Table 1). A smaller gain in the transportation category offset larger increases in apparel and upkeep, entertainment and other goods and services.

Compared to 1987, inflation in 1988 was higher in the categories of food and beverages, housing and apparel and upkeep. But transportation inflation was much lower.

Inflation in the food and beverages category returned to the 4 percent range measured each year between 1982 and 1986, though food at home price increases accelerated to 5 percent, the highest since 1981. The greatest inflation on record in the fruits and vegetables category (21 percent) largely was responsible for the higher food costs.

Housing costs, which account for 42 percent of the entire index, rose 4 percent in 1988, up from the 2.2 percent gains measured in 1986 and 1987. While shelter cost increases remained modest, a reflection of an overbuilt market, fuel and other utilities and household furnishings and operations both experienced higher inflation in 1988.

Inflation in the transportation category continued to seesaw, rising 2.5 percent in 1988 following a 9 percent gain in 1987. Motor fuel prices declined by 8 percent after rising 10 percent the preceding year.

For the second consecutive year, medical care inflation was approximately 4 percent, roughly equal to the all-items rate. Hospital costs, however, resumed rapid increases, up 12.5 percent.

Apparel and upkeep costs rose by the most on record (8 percent), and

TABLE 1
METROPOLITAN PHOENIX CONSUMER PRICE INDEX
Annual Average, Selected Items

Expenditure Category	*1988 Relative Importance*[1]	*1988 Index (1982-84 = 100)*	Percent Change *1988*	*1987*	*1986*
ALL ITEMS	100.0%	120.2	4.1	4.1	1.3
Food and Beverages	16.4	119.5	4.3	1.9	4.2
Food	14.8	118.4	3.7	1.8	4.0
Food at Home	8.5	120.4	5.2	2.5	4.1
Cereal and Bakery Products	1.1	133.8	7.0	4.4	5.8
Meats, Poultry, Fish, and Eggs	2.5	112.9	4.9	2.9	2.5
Dairy Products	1.2	112.4	1.6	2.8	2.7
Fruits and Vegetables	1.3	144.3	21.1	3.4	1.7
Other Food at Home	2.4	113.9	–0.9	0.4	6.8
Food Away from Home	6.3	116.4	2.1	0.3	3.8
Housing	42.4	115.8	3.9	2.2	2.2
Shelter	28.2	115.5	2.6	2.0	3.5
Renters' Costs	7.7	118.6	0.9	–0.4	2.8
Homeowners' Costs	20.4	118.1	3.1	3.2	3.8
Fuel and Other Utilities	6.8	118.1	7.5	3.7	–2.0
Gas (piped) and Electricity	3.9	114.5	6.7	4.6	–3.7
Household Furnishings/Operations	7.4	114.6	5.0	1.2	1.4
Apparel and Upkeep	5.8	119.9	8.3	1.8	1.5
Transportation	19.1	117.2	2.5	8.9	–5.6
Private Transportation	16.6	117.3	2.4	9.4	–5.7
New and Used Cars	7.2	129.8	6.2	6.9	–1.2
Motor Fuels	3.4	75.7	–8.2	9.5	–25.1
Public Transportation	2.5	112.1	4.0	3.0	–4.7
Medical Care	6.7	146.5	3.9	4.4	5.7
Entertainment	4.6	140.5	7.3	6.4	6.8
Other Goods and Services	5.0	132.6	5.7	5.9	4.6

[1] Expressed as a percent of all items. The relative importance of the seven major categories sums to 100.0 percent. Only selected detail items are shown; thus, the relative importance of these items will not sum to that of the major categories.

Source: Center for Business Research, College of Business, Arizona State University; in cosponsorship with Valley National Bank.

TABLE 2
CONSUMER PRICE INDEX
METROPOLITAN PHOENIX AND UNITED STATES
1988 Annual Average Percent Change

Expenditure Category	*Phoenix*	*United States*
ALL ITEMS	4.1	4.1
Food and Beverages	4.3	4.1
Housing	3.9	3.8
Apparel and Upkeep	8.3	4.3
Transportation	2.5	3.1
Medical Care	3.9	6.5
Entertainment	7.3	4.3
Other Goods and Services	5.7	6.6

Source: Metropolitan Phoenix data compiled by the Center for Business Research, College of Business, Arizona State University, in cosponsorship with Valley National Bank; other data are from the U.S. Department of Labor, Bureau of Labor Statistics.

entertainment costs and prices of other goods and services continued to rise at well above the all-items average rate.

COMPARISON AREAS

Overall inflation in the Phoenix area in 1988 was identical to the national average. Rates also were similar for the three most important categories—food and beverages, housing, and transportation (see Table 2). The Phoenix area experienced less inflation than the national average in the other goods and services and medical care categories, but more inflation in the entertainment and apparel and upkeep categories.

Compared to the Tucson area, Phoenix area inflation was higher. The inflation rate in Arizona's two urban areas was nearly identical through 1987 and first quarter 1988 (the annual average increase in 1987 was 4.1 percent in the Phoenix area and 4.4 percent in the Tucson area). In second quarter 1988, however, deflation was measured in the Tucson area at the same time that the Phoenix area experienced relatively high inflation. Thus, despite higher inflation rates in the third and fourth quarters, Tucson area annual average inflation was just 2.3 percent.

1988 FORECAST ACCURACY

At the beginning of 1988, nearly all forecasts of 1988 national inflation fell within a 4 to 5 percent range. The annual average of 4.1 percent almost matched the consensus forecast of 4.3 percent. For the Phoenix area, the consensus forecast of 4.5 percent was slightly high; the 4.1 percent actual value nearly matched the CBR's 4.2 percent forecast.

1989 OUTLOOK

The 1989 annual average increase in the national CPI is expected to be between 4.5 and 5 percent, a slight acceleration over 1988. The *Arizona Blue Chip* panel foresees an increase of about 5 percent for the Phoenix area. The Center for Business Research's forecast is similar—a 5.1 percent increase.

Phoenix area inflation began 1989 at a 5 percent annual rate. Because of a small increase in first quarter 1988, the year-over-year rate probably will accelerate in the first quarter to between 5.5 and 6 percent. After that, the year-over-year rate should drop back to slightly less than 5 percent by year end, assuming a fairly steady quarterly inflation rate of 1.0 to 1.5 percent throughout the year.

As the 1988 drought recedes in time, the inflation rate in food and beverages is likely to diminish during 1989, offsetting a probable acceleration in the medical care component.

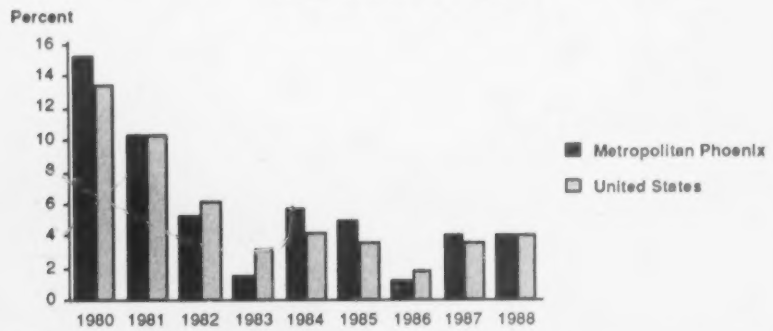
Housing inflation likely will remain moderate and steady. Even if some improvement in occupancy rates occurs as expected, apartment vacancies should remain a problem, holding renters' cost increases to near zero through 1989. Slow growth of the Valley's population and higher than normal vacancy rates should also hold homeowners' cost increases down.

Gasoline prices, and transportation costs in general, have been highly volatile for years, making their forecast difficult. Higher inflation than in 1988 seems likely and would be a primary cause of 1989's projected higher overall inflation rate.

Inflation in entertainment and other goods and services has outpaced the overall rate for years and is likely to do so again in 1989, even though rates in 1989 may match those in 1988. Inflation in clothing prices is unlikely to match 1988's high level.

– Tom R. Rex
Research Manager

FIGURE I
METROPOLITAN PHOENIX AND U.S. CONSUMER PRICE INDEXES
Annual Percent Changes



Source: Center for Business Research, College of Business, Arizona State University; in cosponsorship with Valley National Bank.

CPI Description Available

A description of the Consumer Price Index, available from the Center for Business Research, answers such common questions about the CPI as:

- What is the difference between the CPI for all urban consumers (CPI-U) and the CPI for urban wage earners and clerical workers (CPI-W)?
- What is the relationship between the CPI and the inflation rate, and how is this rate calculated?
- Is the CPI a cost-of-living index?
- How is the CPI applied in contractual agreements?

To obtain a copy of the CPI description, call (602) 965-3961.

Metro Phoenix CPI

The Metropolitan Phoenix Consumer Price Index (CPI), on which these inflation figures are based, is prepared by the Center for Business Research in the ASU College of Business. The Center conducts comprehensive pricing surveys each quarter, in cosponsorship with Valley National Bank.

Differences in Population Growth by Age Bracket Are Striking

Mostly due to variations in the national birth rate, the age distribution of both the national and Arizona population is undergoing substantial change. Relatively low birth rates during the depression years of the 1930s and war years of the early 1940s have led to a relatively small cohort of individuals currently aged between 45 and 60. The baby-boom that occurred from 1946 to 1964 led to a substantially larger group now aged between 25 and 43. Declining birth rates in the late 1960s and 1970s led to a smaller number of people now aged roughly 10 to 21 years old.

The heavy in-migration to Arizona will not have a substantial impact on these relative cohort sizes. Arizona's age distribution has not differed substantially from the national age distribution, and probably will not differ through the end of the century. Currently, Arizona has relatively fewer people aged 35 to 54 than the national average, relatively more children under 5 years old and slightly more people aged 65 to 74.

CHANGES BY AGE BRACKET

The number of pre-school age children rose at a slower rate than that of the overall population in the 1970s (see Table 1), and slightly faster in the 1980s (because the entire baby-boom generation was in child-bearing years), but should grow very little in the 1990s because the baby-bust generation will replace the baby-boom generation in the prime child-bearing years.

Growth of the school-age population lagged behind the overall population through the 1970s and 1980s, but should equal the total growth rate in the 1990s. The college-age population grew faster than the average in the 1970s, but hardly changed in the 1980s. Growth of this segment should be faster, but still below average, in the 1990s.

The number of young adults (25-34 age bracket) exploded in the 1970s with fast growth continuing into the 1980s. Their proportion of the population peaked around 1987. Despite the substantive net in-migration expected in Arizona in the 1990s, the number of young adults will *decline*.

Growth in the 35-44 age bracket was average in the 1970s, boomed in the 1980s as the baby boomers aged into this bracket, and should continue to surge through the mid-1990s. The progression in the 45-54 age bracket will occur 10 years later: slow growth in the 1970s, average in the 1980s and rapid in the 1990s.

Retirement-age migration to Arizona begins in the 55-64 age bracket. Though this group experienced fast growth in the 1970s, the decline in depression-era births slowed growth in the 1980s. It should accelerate to slightly above that of the overall population in the 1990s.

The rate of growth in the number of retirement-aged people (65 to 74) exceeded that of the overall population throughout the 1970s and 1980s. In the 1990s, however, this group will not expand as much as the overall population. Retirement-related migration to Arizona will not become much more numerous until after the end of the century.

The oldest age group—those 75 and older—should continue to increase in number at about twice the overall rate, as it has since 1970.

To the many public sector programs that serve particular age groups, population changes by age are crucial to determining future needs. Likewise, private sector firms whose business caters to people of certain ages need to be aware of these changes.

– Tom R. Rex
Research Manager

TABLE 1
ARIZONA AGE DISTRIBUTION

Age	1970	1980	1985	1990	1995	2000	1970-80	1980-90	1990-2000
	Population in Thousands						*Percent Change*		
Less than 5	159	214	271	299	305	320	35	40	7
5-17	474	578	604	690	815	894	22	19	30
18-24	223	369	371	376	385	442	65	2	18
25-34	217	444	557	628	627	617	105	41	–2
35-44	195	298	402	530	652	725	53	78	37
45-54	190	252	276	343	472	617	33	36	80
55-64	152	257	288	307	343	428	69	19	39
65-74	108	202	248	296	343	362	87	47	22
75 and older	54	105	144	186	238	306	94	77	65
TOTAL	1,775	2,718	3,161	3,655	4,180	4,710	53	34	29
	Percentages						*Change in Percentages*		
Less than 5	9.0	7.9	8.6	8.2	7.3	6.8	–1.1	0.3	–1.4
5-17	26.7	21.3	19.1	18.9	19.5	19.0	–5.4	–2.4	0.1
18-24	12.6	13.6	11.7	10.3	9.2	9.4	1.0	–3.3	–0.9
25-34	12.2	16.3	17.6	17.2	15.0	13.1	4.1	0.9	–4.1
35-44	11.0	11.0	12.7	14.5	15.6	15.4	0.0	3.5	0.9
45-54	10.7	9.3	8.7	9.4	11.3	13.1	–1.4	0.1	3.7
55-64	8.6	9.5	9.1	8.4	8.2	9.1	0.9	–1.1	0.7
65-74	6.1	7.4	7.8	8.1	8.2	7.7	1.3	0.7	–0.4
75 and older	3.0	3.9	4.6	5.1	5.7	6.5	0.9	1.2	1.4

Source: Historical data from U.S. Department of Commerce, Bureau of the Census. Population projections from Center for Business Research, College of Business, Arizona State University.

Coincident Indexes Rebound in November

The coincident economic index for each area of Arizona registered a solid advance in November, seemingly marking an end to the period of declining economic activity recorded between the spring and early fall. The strong growth in November should be regarded cautiously, however. It is unlikely to be soon repeated.

After five consecutive monthly declines, the coincident index for Maricopa County rose 0.7 percent to 147.0. Economic growth remained weaker in the Phoenix area than in the rest of the state; Maricopa's index was 0.9 percent below its May 1988 peak.

A 0.9 percent gain in Pima County's index in November placed it at 138.8, just 0.1 percentage point below its peak. Likewise, the index for rural Arizona was 0.1 percentage point less than its highest value, advancing 1.6 percent in November to 131.2. The composite statewide measure rose 0.9 percent to 142.9.

The impetus for the large gains came particularly from a statewide improvement in the unemployment rate, following four months of worsening conditions. Commercial building permit valuations also rose statewide, though by less in Maricopa County than elsewhere. The construction advances probably were nothing more than a continuation of the pattern of large monthly fluctuations common in the last couple of years.

Employment fell slightly in the metropolitan areas, but rose in non-urban Arizona. The number of people working remained less than the number recorded in early 1988, especially in Maricopa County. Retail sales were flat throughout the state in November.

A preliminary look at December's employment and unemployment data suggests that the economy throughout the state expanded, but at a slower rate than in November. Revisions to these series for all of 1988 will be included in the next monthly report.

TABLE 1
PERCENT CHANGE IN COINCIDENT INDEXES

	Monthly			Annual		
1988	*Maricopa*	*Pima*	*Non-urban*	*Maricopa*	*Pima*	*Non-urban*
January	1.1%	.7%	1.5%	5.6%	5.7%	5.7%
February	.5	.8	–.5	5.8	5.7	4.5
March	.8	.3	.6	6.0	4.9	5.2
April	.1	–.8	–.9	5.5	4.3	4.4
May	.2	–.6	–.5	5.2	3.3	3.6
June	–.2	.5	–.0	4.3	2.6	4.4
July	–.2	–.4	–1.2	3.1	2.4	2.8
August	–.0	.1	.3	2.7	2.5	2.5
September	–.9	.2	.1	1.6	2.2	1.5
October	–.3	.2	.6	0.7	1.7	1.3
November	.7	.9	1.6	2.1	1.6	2.4

TABLE 2
PERCENT CHANGE IN MARICOPA COUNTY COINCIDENT INDEX

	Monthly		Annual	
1988	*Official*	*Alternate*	*Official*	*Alternate*
January	1.1%	.7%	5.6%	4.1%
February	.5	.4	5.8	4.5
March	.8	.7	6.0	4.6
April	.1	–.1	5.5	3.9
May	.2	.2	5.2	3.8
June	–.2	–.4	4.3	2.8
July	–.2	.1	3.1	1.8
August	–.0	.3	2.7	1.8
September	–.9	–1.0	1.6	0.9
October	–.3	–.2	0.7	0.3
November	.7	.3	2.1	1.2

Source (Tables 1 and 2): Center for Business Research, College of Business, Arizona State University.

ALTERNATE CALCULATION

From spring into fall 1988, the coincident indexes measured considerable weakness in the Arizona economy. As seen in Table 1, each area experienced several months of declining economic activity. Annual growth rates started the year in excess of 5 percent, but had fallen to near 1 percent by October.

Further, each area experienced successive monthly declines totaling at least 1 percent. Only rarely in Pima County and non-urban Arizona—and never before in Maricopa County—had such a decline not indicated the end of an expansionary period. Yet, as the November indexes attest, a recession was not close at hand.

Rising unemployment rates contributed considerably to the slow and negative growth recorded in 1988. At times, however, especially during the current economic cycle, the unemployment rate measures more than economic activity; it also measures the mismatch of in-migration to job availability. Thus, the Center for Business Research recently explored whether the unemployment rate's weight in the coincident indexes was too high.

Alternate series were constructed, lowering the importance of the unemployment rate. The results were inconclusive; the alternate measure fit the Gross County Product series only slightly more accurately, particularly in Maricopa County since 1984. A comparison is shown in Table 2. In the alternate series, monthly growth rates were lower in 1987 and early 1988. Annual growth rates were less throughout 1988, but both series agree that growth nearly disappeared by October.

– **Tom R. Rex**
Research Manager

GSP Growth Slows Further in Third Quarter 1988

Annual growth in Arizona's Gross State Product slipped to only 1.5 percent at the end of third quarter 1988, far below the 3.7 percent growth recorded in the Gross National Product. Growth of adjusted GSP, which excludes the volatile mining and agriculture industries, was even less at 1.3 percent.

Economic growth during the first half of 1988 was revised down slightly, with lowered growth in the second quarter more than offsetting an improvement in the first quarter. Even with these revisions, seasonal problems remained, as seen in Table 1.

Unlike recent quarters, when the gross products of various industries, particularly construction and FIRE (finance, insurance and real estate), declined, all industries except agriculture recorded an increase in gross product in the third quarter.

The gross products of several industries, including services, trade, manufacturing and TCPU (transportation, communications and public utilities), expanded from 3 to 5 percent between third quarter 1987 and third quarter 1988. Declines of about 4 percent, however, were recorded for both construction and FIRE.

Annual GSP growth through third quarter 1988 was about equal to the percent increase in employment, which ranked 40th among the 50 states. Likewise, Arizona ranked 40th on personal income growth through third quarter 1988: 6.6 percent (not inflation-adjusted).

After 2.2 percent growth in 1987, Arizona's gross product appears to have expanded less than 2 percent in 1988, about equal to the annual average increase in employment. The gain in the coincident index also was similar. GSP growth probably will accelerate in 1989, but only to between 2 and 3 percent.

– Tom R. Rex
Research Manager

TABLE 1
REAL ECONOMIC GROWTH

	Quarterly Percent Change			Annual Percent Change		
		Adjusted			*Adjusted*	
	GSP	*GSP*	*GNP*	*GSP*	*GSP*	*GNP*
1st Quarter 1987	–0.6	–1.6	1.1	1.1	1.3	1.5
2nd Quarter 1987	1.4	1.6	1.2	2.6	2.1	3.0
3rd Quarter 1987	0.9	1.1	1.1	2.5	2.8	3.9
4th Quarter 1987	0.9	1.9	1.5	2.6	3.0	5.0
1st Quarter 1988	–1.1	–1.7	0.8	2.1	2.9	4.8
2nd Quarter 1988	1.0	0.3	0.7	1.8	1.6	4.2
3rd Quarter 1988	0.7	0.8	0.6	1.5	1.3	3.7

Notes: Annual percent change compares gross product in a given quarter to that of the same quarter of the prior year. All GSP data since fourth quarter 1987 were revised.

Source: Gross State Product (GSP) and adjusted GSP (minus the contributions of the agriculture and mining industries) from Center for Business Research, College of Business, Arizona State University. Gross National Product (GNP) from U.S. Department of Commerce, Bureau of Economic Analysis.

January Purchasing Indicators Reflect Sluggish Economy

The Arizona economy marked time in January, for the third month in a row. New orders received, production, and inventory levels of purchased materials all were unchanged from the previous month. Employment fell again, for the third consecutive month, while prices paid for purchased items escalated sharply, flashing an early warning of higher inflation down the road.

As the economy uses a higher percentage of available resources, upward price pressures will intensify. Until new orders gain back some of their previous strength, it is unlikely that any resumption of overall economic growth will occur. The employment picture probably will deteriorate even further before any robust growth begins.

– Harold Fearon

TABLE 1
JANUARY PURCHASING SURVEY

	Percent of Purchasing Managers Indicating Each Response (January compared to December)		
Key Indicators	*Higher*	*Same*	*Lower*
Prices paid for major commodities	55	42	3
Delivery time from vendors	28	64	8
Purchased materials inventory level	28	45	27
New orders received	32	38	30
Production	28	45	27
Employment	15	66	19
Purchases	38	34	28

Source: Purchasing Management Association of Arizona, Purchasing Management Association of Southern Arizona, and the Northern Arizona Group.

Dr. Fearon is the National Association of Purchasing Management Professor in the ASU College of Business.

Arizona Leading Index Declined in December

The Arizona index of Leading Economic Indicators dropped in December to 110.5—a figure 0.4 percent above the 110.1 figure for December 1987 (1977 = 100).

Inventories, production, new orders, residential building permits, and employment had a negative impact. Sensitive prices, the money supply, and delivery times were positive influences. Manufacturing hours were neutral and unemployment insurance claims were unavailable.

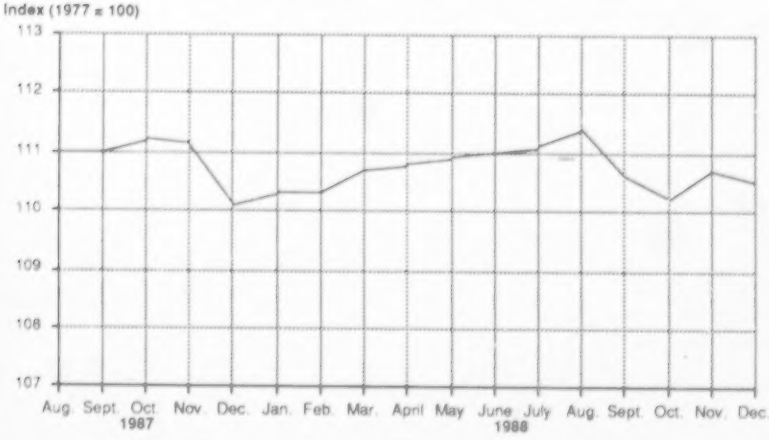
ANALYSIS

The construction industry is a very important part of the Arizona economy. The leading index tracks construction activity through the seasonally adjusted real dollar value of residential building permits in Maricopa County. Maricopa County data are used, because they are often available earlier and represent a majority of the activity for the state. The corresponding component in the national index is new private housing units started.

Using the dollar value of residential building permits instead of a measure like housing units started allows the Arizona leading index to capture the differences in economic impact between various types of housing units. The economic impact of building 300 single-family homes is likely to be significantly greater than the impact of building 300 apartment units.

Ideally, the change in the dollar value of residential building permits should be measured free from the distortion of inflation. In practice, the dollar value is adjusted using the consumer price index for all urban consumers. This price index satisfies the requirement for a broad-based index that is available monthly.

FIGURE I
ARIZONA INDEX OF LEADING ECONOMIC INDICATORS



Source: Economic Outlook Center, College of Business, Arizona State University; sponsored by Citibank (Arizona).

OUTLOOK

The index continues to move within a narrow range suggesting little change for the Arizona economy in the first half of 1989. The state's economy is benefiting from the continued strong performance of the national economy.

– **Tracy L. Clark,** *Economist*
Economic Outlook Center

TABLE 1
NET CONTRIBUTION OF INDIVIDUAL COMPONENTS TO THE ARIZONA INDEX OF LEADING ECONOMIC INDICATORS

	Net Contribution*			
	Sept.	*Oct.*	*Nov.*	*Dec.*
Delivery Time*	–.08	–.03	.01	.01
Inventory Levels*	–.06	.14	–.12	–.09
New Orders*	–.08	.06	–.03	–.06
Production*	.01	.02	–.01	–.08
Employment*	–.03	–.10	.01	–.02
Residential Building Permits	–.24	–.20	.38	–.06
Unemployment Insurance Claims	.00	.00	.00	.00
Average Workweek, Manufacturing	.00	–.07	.12	.00
Money Supply	–.11	–.13	.10	.04
Change in Sensitive Materials Prices	–.07	–.08	–.02	.07
OVERALL INDEX CHANGE (%)	–.67	–.40	.45	–.19

*The net contribution of each component is calculated by multiplying the monthly percent change in its index by its relative importance.

*Based on indicators from the purchasing management associations of Arizona and southern Arizona.

Source: Economic Outlook Center, College of Business, Arizona State University; sponsored by Citibank (Arizona).

The Arizona leading index is based on 10 economic indicators, combined and weighted to project the pace of economic activity several months ahead. Five of the components come from a monthly survey of Arizona purchasing managers conducted by Dr. Harold Fearon. The Arizona Index of Leading Economic Indicators is sponsored by Citibank (Arizona).

ARIZONA ECONOMIC INDICATORS

	Month or Quarter	Value	Percent Change from Previous Period	Percent Change from Year Ago	Year-to-Date Value	Year-to-Date Percent Change from Year Ago
GROSS STATE PRODUCT (In Billions of Dollars, at Annual Rate)						
Arizona - Current Dollars	3rd Qtr.	60.034	1.6	5.4	NA	NA
Arizona - 1982 Dollars	3rd Qtr.	48.002	0.7	1.5	NA	NA
COINCIDENT ECONOMIC INDEXES (1982 = 100)						
Arizona	Nov.	142.9	0.9	2.1	NA	NA
Metropolitan Phoenix	Nov.	147.0	0.8	2.1	NA	NA
Metropolitan Tucson	Nov.	138.8	0.9	1.6	NA	NA
Non-urban Arizona	Nov.	131.2	1.6	2.3	NA	NA
CONSUMER PRICE INDEX (1982-84 = 100)						
Metropolitan Phoenix	4th Qtr.	122.5	1.3	5.1	NA	NA
INDEX OF LEADING ECONOMIC INDICATORS (1977 = 100)						
Arizona	Dec.	110.5	-0.2	0.4	NA	NA
BUILDING PERMITS (Total Dollar Value in Thousands)						
Maricopa County	Nov.	224,279	-11	2	3,167,390	-13
Pima County	Nov.	43,317	49	0	436,334	-20
Balance of State	Nov.	54,896	19	47	635,264	2
Arizona	Nov.	322,492	-1	7	4,238,988	-11
TOTAL HOUSING UNITS AUTHORIZED						
Maricopa County	Nov.	1,187	-23	-24	20,292	-23
Pima County	Nov.	233	-33	18	4,869	-17
Balance of State	Nov.	1,112	57	18	9,241	-8
Arizona	Nov.	2,532	-3	-6	34,402	-19
HOME SALES						
Maricopa County - Number	Dec.	3,710	14	14	50,820	-14
Maricopa County - Median Price	Dec.	83,000	1.2	-0.3	80,675	0.8
HOUSING AFFORDABILITY INDEXES						
Metropolitan Phoenix - New Homes	4th Qtr.	91	-1.1	1.1	NA	NA
Metropolitan Phoenix - Resale Homes	4th Qtr.	123	3.4	3.4	NA	NA
MORTGAGE INTEREST RATES (Conventional, 30-year, Fixed-rate)						
Maricopa County	Jan.	10.7	0.9	2.9	NA	NA
POPULATION ESTIMATES (In Thousands)						
Maricopa County	4th Qtr.	2,037	0.6	2.2	NA	NA
Arizona	4th Qtr.	3,534	0.8	2.2	NA	NA
ELECTRICAL POWER SALES (In Millions of Kilowatt Hours)						
Arizona	Nov.	3,528	-1.9	28.1	40,719	14.6
	Dec.	3,649	3.4	11.4	44,368	14.3

NA = Not Applicable

Source: Center for Business Research, College of Business, Arizona State University.

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